Abstracts.

Neurology.

NEURO-ANATOMY AND NEUROPHYSIOLOGY.

[125] On the application of micrometry to the study of the area striata.—

This is a preliminary study, more concerned with the elaboration of a
 technique than with the results which have accrued from its use. The
 method employed was the microscopic measurement of the cortical laminae,
 using the Weigert-Pal technique in serial coronal sections. The measurement
 by fibre stains was found to be more accurate than that by cell stains, as the
 fibres gave an indication whether the sections were truly at right angles to the
cortex, and measurements were only taken from those regions where a single
 fibre could be traced from the white matter to the third cortical layer. It was
 found necessary to measure the laminae both at the superficial and deep parts
 of the gyri as the relative thickness of the various laminae was often different
 in these two situations. In this way it was found that the area striata could
 be divided into two fields: a posterior field in which the fundus measurements
 are less than those at the surface, and an anterior field where measurements at
 these two situations are approximately equal. The author considers that this
 method might be of use to elucidate anatomical and pathological problems,
 and to map out new fields in the cerebral grey matter.

J. G. GREENFIELD.

[126] The arterial circulation of the cerebellar cortex—a comparative study
 (La circolazione arteriosa della corteccia cerebellare; studio comparativo).—I. FAZZARI. Riv. di pat. nerv. e ment., 1924, xxix, 425.

A review of the comparative anatomy of the cerebellar arteries in various
 animals, which cannot be abstracted but which is useful for reference. The
 author finds that the distribution of arteries and capillaries in the cerebellar
cortex is fundamentally the same in all the animals examined. A special type
 of short artery is found belonging to the molecular layer and a different type
 for the deeper layers. In man there is a third, longer type not developed in
 other animals.

R. G. GORDON.

A long comparative study of the anatomy and pathology of the region of the substantia nigra in the dog, the cat and the rabbit. This depends on and has connection with both cortex and corpus striatum, influences passing to the substantia nigra from both regions. It also has connections with other regions of the brain, such as the thalamus.

R. G. Gordon.


This article consists of a comparatively brief résumé of the views held by the distinguished neurologist, von Monakow, in respect of the connexions of the corpus striatum with the rest of the brain. They are based on older experimental work of his own and on more recent examination of material derived from various cases of cerebral disease (some twenty-five in all) conducted more particularly by one of his collaborators, Dr. Kodama.

Monakow stresses the anatomo-histological differences between the putamen and caudate on the one hand, and the globus pallidus on the other. The two former have no direct connexion with the cerebral cortex, and it is satisfactory to have confirmation of this significant fact from so eminent an authority. In this respect these two collections of grey matter differ fundamentally from the optic thalamus, for example, which the author declares might be essentially considered as a part of the cortex. The fibres in relation with the globus pallidus he regards as a sort of corona radiata of that organ, which he holds connect it with frontal and temporal lobes, as well as with the adjacent subthalamic and mesencephalic nuclei.

The globus pallidus myelinates much earlier (fifth and sixth month) than the putamen and caudate. It is considered by Monakow to be an association centre linking calotte and mesencephalon with the cortex. This pallido- tegmental system stands out as an autonomous system when there is profound cortical disease with complete degeneration of the internal capsule.

Various motor disorders, declared by the author to be of an “irritative” character, such as those seen as a sequel to some cases of epidemic encephalitis, are not always the consequence of destructive lesions, but are stated to be conditioned on occasion by secretory modifications of the cerebrospinal fluid.

S. A. K. W.
These studies on the cat lead to the conclusion that striated muscle tone depends on sympathetic innervation, which is excitatory and not inhibitory, tone increasing with excitation of the sympathetic nerve fibres. These run with the peripheral nerves in this animal.

R. G. Gordon.

The author has worked entirely on the frog, and his experiments lead him to the following conclusions. A muscle removed from the body is completely atonic. It can be shown to be possessed of two properties, plasticity and elasticity. The former is defined as the property of undergoing a slow change of shape under the influence of external forces. Plasticity is highly variable, whereas elasticity is almost constant, being scarcely modifiable by external agencies. A reflex muscular contraction is not a continuous phenomenon, but is made up of twitches of the individual fibres constituting the muscle, and the first of these begin during the latent period of the reflex, this being, as a fact, much shorter than ordinary graphic methods indicate.

Contractile tone is the result of an adaptive reflex whereby the length of a muscle is reflexly adjusted in relation to existing tension. On it depends the ability to pass from a movement to an attitude and the maintenance of an active attitude. Thus at the end of every reflex movement it should be possible to discover a brief period of contractile tone, and Langelaan considers this is the best way to study that tone, viz., by observation of the termination of reflex movements. Contractile tone is made up of a weak inco-ordinated contraction of the muscle fibres, not all of them contracting simultaneously, nor are the contractions of those which are in action at one time strictly synchronous. Artificial excitation of a muscle effects a simultaneous contraction of all its fibres, and can thus never produce a state of contractile tone.

Plastic tone is the result of tissue tension; it increases and diminishes along with variation in that tension. Tissue tension (in this instance that of the muscle fibre) is neither a hydrostatic nor an osmotic phenomenon; it is a sequel to the shape of the fibre, and depends probably on capillary forces, that is, is of the nature of surface tension. Tissue tension is sustained and regulated reflexly by sympathetic nerves. Contractile tone depends on spinal motor mechanisms and plastic tone on spinal sympathetic mechanisms.

Relying on the researches of Cajal, the author states that both pyramidal and sympathetic tone mechanisms can be, and are, simultaneously set in action, and tone-impulses of afferent origin fused, by means of the nucleus intermedio-medialis. This collection of cells in the grey matter of the cord receives collaterals from the entering dorsal root fibres and its cell axons bifurcate to pass both to the cells of the intermedio-lateral tract and the cells of the ventral cornua. Both motor and sympathetic efferent fibres end
in the sarcoplasm of the muscle fibre, and by its mediation are connected with the contractile part of the fibre. The sarcoplasm conducts excitations through the muscle. It is probable that the sympathetic supply is responsible for the functional state of the sarcoplasm, and so, possibly, for its capacity to pass on stimulations.

In the matter of the tendon reflex, the author first stretches the frog's gastrocnemius slightly; this is followed by an increase in tension, which in turn results in a brief period of reflexly-produced contractile tone. During this brief moment (five to ten seconds) the tendon is tapped, and the tendon reflex is seen as a longitudinal wave of contraction passing along the muscle. Mere stretching of the muscle is insufficient for this; the augmentation effected by the reflexly excited, if transient, contractile tone, is essential. In accordance with the work of other investigators, the author finds that percussion of the tendon gives rise to (1) an idiomuscular contraction, and (2) a reflex contraction. The whole mechanism of the tendon reflex is quite independent of the sympathetic nerve-fibres supplying the muscle; it persists after rami communicantes have been cut.

S. A. K. W.


This paper records the results of examination of the state of the anterior horn cells sixteen days after the amputation of the thigh in its lower third.

In the fourth lumbar segment no changes were found except for a few cells in the external group. In the fifth segment the cells of the posterior group of the corresponding side were almost all affected and a few cells on the opposite side. In the lower part of the segment a few cells were affected in the central group. The same incidence was found in the first, second and third sacral segments, but in the lower part of the second and in the third segments all the cells of the post-posterolateral group were affected. None of the cells of the anteroexternal or of the small central or anterior groups were altered.

The conclusions drawn from these results are that:

The most posterior groups of the last two sacral segments are concerned with the innervation of the foot.

The central group is concerned with the adductors in the fourth lumbar segment, and with the hamstrings lower down.

The external group of the fourth lumbar is concerned with the quadriiceps, the anteroexternal group of the fifth with the hip muscles, and the central group with the perineal muscles. The small anterior group is of uncertain function, but is not concerned with muscles of the lower limb.

A few fibres concerned with muscular innervation apparently cross to the other side.

The arrangement of these cell groups is remarkably constant, the anterior
muscles being represented at a higher level, and more externally in the spinal column. This corresponds to the arrangement in the upper limb.

R. G. GORDON.


With a view to determining the true nature of the normal spinal fluid immediately after birth the author performed lumbar puncture on 423 babies, no regard being taken as to the character of labour or the condition of the child at birth. The great majority of punctures were made within the first twenty-four hours, and on many patients a subsequent puncture was done about the ninth day of life.

The routine examination of the spinal fluid for cellular elements gave data of no unusual interest. The average cell count was 6-3 per cubic millimetre, the highest being seventeen, which occurred in a fluid giving a 4 plus Wassermann reaction, and the lowest recorded being two. The majority of fluids showing a positive Wassermann reaction gave counts above ten, though several were as low as three or four. As the observations progressed, one striking feature of the fluids was noted. No fluid was obtained which was absolutely colourless, all showing some degree of pigmentation, varying from a pale straw to a deep yellow. In no case was there any evidence of jaundice during the first twenty-four-hour period in which the primary puncture was done, and no relation existed between the character of the labour and the intensity of the pigment. The size and general physical development of the child, however, had a definite bearing on the degree of xanthochromia. All premature infants, small full-term infants and twins invariably showed a marked pigmentation, while as a general rule the large full-term babies gave a fluid that contained relatively little pigment.

The presence of blood in macroscopic quantities, not resulting from the spinal puncture, was regarded as evidence of intracranial hemorrhage, and this condition was found to exist in sixty infants, but in only twenty-six were there any clinical symptoms attributable to intracranial hemorrhage.

The conclusion is reached that xanthochromia of the spinal fluid in new-born infants is a physiological condition and is in no way dependent on the existence of hemorrhage or other pathological condition of the nervous system.

R. M. S.

NEUROPATHOLOGY.


This short article is an apologia for the name 'état marbré,' and a reply to a paper by Scholz in which he proposes to rename the condition "Partial infantile sclerosis of the striatum." The author rejects this nomenclature on three main grounds:—(1) That the status marmoratus is shown by clinical evidence to occur during fœtal life, in which case it is not infantile. (2) That the characteristic of the condition is hypermyelination of the finest fibres of the striatum; this may result from destruction of some of the fibres of the